

RENEWABLE ENERGY ASSOCIATION OF SWAZILAND

ENERGY AND WOMEN:  
NATIONAL CONSULTATION FOR  
SWAZILAND

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1. INTRODUCTION	
1.1 Background Information and Purpose of the Consultancy	

Since 1997 UNDP has focused on the linkage between women and energy as means to promote sustainable development. This is conducted under the Energy and Atmosphere Programme's Sustainable Energy Programme. The idea is that involving women in all aspects of the energy sector can enhance economic development and improve the quality of lives of women and communities in developing countries.

In most households women tend to be the providers and end users of traditional energy sources, like for example fire wood. This is because traditionally their work tends to be around the home. In the past most of the energy assistance to a country has been targeted at national energy supplies leaving out the direct end user of energy in households. The realisation that women are the end users of household energy has prompted UNDP to directly address the linkage between women and energy. The UNDP Project Document, Energy and Women: Generating Opportunities for Development (number GLO/98/G23/A/3W/31) states that "UNDP has determined that 20% of all programme financing and activities be focused on women and development." This report outlines the problems faced by women in the energy sector and means by which they can develop sustainable energy projects that can also lead to income generation. The basis of this report is literature review and national consultation.

## 1.2 The Economy

Swaziland's economy is closely linked to the South African economy. The currencies of the two countries, Lilangeni (E) in Swaziland and Rand (R) in South Africa are at *par*. Swaziland gets most of her imports from South Africa and sends about half of her exports to South Africa. Swaziland is also a member of the South African Customs Union (SACU) an agency that collects all customs receipts from member countries. The collected amount is then proportionally distributed annually to member countries. The Swaziland Government gets almost 50% of her revenue from SACU.

The economy of Swaziland currently looks good relative to most Sub-Saharan African countries, but a lot of effort is required to improve it or even prevent it from declining. The Swaziland economy grew at a very high rate in the eighties reaching annual growth rate of over 6% in 1995 (Central Statistics Office) since at that time Swaziland provided one of the most attractive investment climates in the region. By 1995 the income per capita reached US\$1,100, which is very high by Sub-Saharan African standards. The developments in South Africa and Mozambique this decade has reduced the advantage that Swaziland had in the eighties. Some businesses would prefer to be located in South Africa where they can have direct access to a much larger consumer base. In Mozambique industries are being developed that directly compete with industries in Swaziland. For example, Swaziland Brewers used to export a lot beer to Mozambique, but now Mozambique has built her own brewing facilities cutting the imports from Swaziland. Also, Alpha Cement was exporting cement to Mozambique but now Mozambique has developed her own cement industry and cut down on Alpha Cements exports. South Africa is also contemplating eliminating SACU from which the Swaziland Government gets about 50% of her revenue. Other considerations on the economy include the fast growing population, the re-emergence of tuberculosis in the country and the threat of AIDS. All these factors show that Swaziland must develop sound economic strategies to survive in the next millennium.

The economic strategies developed must also involve the energy sector, which is of interest in

this report. Swaziland imports more than 90% of her commercial energy supply from South Africa (ESMAP CG, 1997). This is in the form of oil products, electricity, coal, charcoal, batteries. This energy is used for commercial purposes as well as households. A declining economy can mean tighter energy budgets leading to higher prices and making most households to resort to firewood which is a locally available resource. However, firewood nowadays means cutting growing trees and drying them for firewood. If this practice is accelerated it can lead to land degradation through soil erosion, as has been observed in some parts of Swaziland. It can also lead to the increase in value of firewood forcing rural communities to cut trees at a much higher rate than can be replenished leading to the scarcity of wood. This could mean that women would have to travel longer distances and spend more time just to collect firewood.

Traditionally in Swaziland, the task of collecting firewood for household needs is the responsibility of women. High fuel prices and scarcity of wood can bear directly on the women in the household. When the Ministry of Natural Resources and Energy (MNRE) team was conducting their wood lot project at Luve, east Swaziland, they decided to pose some questions to men and women of the area separately. One of the questions asked was “What is the most serious problem that you are facing in this community?” The response from the men was that it was the scarcity of grazing land for their livestock. The women said that it was the shortage of fire wood. This clearly illustrates that the issue of household energy is more of concern to women than it is to men. Women in all social levels face energy related household problems whether the energy is collected free from the forest, provided free by the employer or obtained from commercial providers. The purpose of this national consultancy is to identify the energy related problems faced by women in all social levels, and means of solving these problems.

### 1.3 The Energy Situation

For energy purposes, Swaziland households can be classified to be under three broad categories, namely, rural areas, urban areas (including peri-urban areas), and company towns. Company towns are built by companies doing business in Swaziland to make it convenient for employees to be close to their work areas. These are mainly in the agriculture, timber and pulp economic sectors. The fuel consumption patterns in these areas vary because of the following factors:

1. Rural households are largely not connected to the electric grid (only 2 % are) and liquified petroleum gas (LPG) is not easily accessible.
2. In most rural households in Swaziland people live on subsistency farming and cannot afford commercial fuels.
3. Some rural areas have plenty firewood while some have none.
4. Urban areas have easy access to the electric grid, LPG and paraffin.
5. In company towns coal is usually provided free as a ration to employees.

*Wood Fuel:* Wood fuel is the most common energy source in Swaziland house holds. According to a study by Lasschuit (1995), in rural areas 90% of gross energy is from wood fuel, while it is 57% for urban areas and 21% for company towns. The reason for lower wood fuel requirements for urban areas and company towns are that coal is provided free in company towns as mentioned above, and that in urban areas a lot of houses are electrified and

some households use either paraffin or LPG to meet their energy needs. In 1995 the total wood contribution to the national energy supply was 25.8% (MNRE, 1997). These figures show that wood plays a major role in the energy supply in Swaziland.

In rural areas the firewood comes mainly from indigenous forest. With the growing population this has led to deforestation. The deforestation also comes about because of land clearing for agricultural activity, increasing numbers of homesteads and cutting of growing indigenous trees for wood fuel to sell to households in urban areas. According to the study by Lasschuit (1994) there are areas where there is significant wood fuel shortages due to deforestation. If conservation strategies are not adopted, wood fuel shortages can reach crisis levels in some areas of Swaziland.

*Electricity:* Electricity is readily available in urban areas and is the most preferred energy source by house holds (Lasschuit, 1995). Most higher income households are connected to the electric grid in these areas. Most of their energy needs are met by electrical energy alone, although some also use wood fireplaces for winter space heating. The advantage of electricity is that it is delivered directly to the home via wires, it does not require special preparation and or cleaning after use. For cooking purposes a multiple hotplate stove with an oven can be used. Water heating is also automatic with the installation of a geyser. A freezer and refrigerator can also be used. On the negative side, the initial cost of electricity installation makes it prohibitively expensive for low income households. The associated costs include the wiring costs, costs of electrical appliances, and installation costs if the nearest 220 V line is more than 100 metres away. In some parts of the urban areas (peri-urban) the electricity connections are used for lighting and ironing and/or cooking on a two-hotplate stove as other appliances are not affordable by the households. In 1995 electricity provided 6.8% of the total energy supply (MNRE - 1997 Energy Bulletin). Of this 6.8%, 84% was imported from South Africa.

*Paraffin:* Paraffin is the fuel of choice in the low income urban area households and is used by 29% of the peri-urban households (Lasschuit 1995). The reason is that it is readily available and cheap, around E1.50 per litre, and is used both for cooking, ironing and lighting. The appliances used with paraffin are very cheap, for example the wick paraffin stove locally known as the “flame paraffin stove” can cost as low as E20.00. Paraffin distribution is easy and paraffin is therefore found readily throughout the country. Shortages though do occur from time to time due to transportation problems as a lot of rural grocery stores depend on buses to replenish their stock. Even though the wick paraffin stove is cheap it has some problems. Some of the problems are that the stoves are not durable, have low efficiency, and release smelling fumes and soot that tend to stick to clothing and other things in the room as a whole. Another disadvantage of the paraffin stoves is that only one cooking utensil can be used at a time. They also pose the risk of exploding if misused. The lighting using paraffin lamps is relatively poor but slightly better than candles if a lamp with a glass shield is used. Paraffin also poses a health problem if not handled properly. Children can drink it if it is in a container without a childproof lead. In 1995 paraffin contributed 1% of the total energy supply in Swaziland (MNRE - 1997 Energy Bulletin).

*LPG:* In 1995 LPG contributed about 0.5% of the total national energy supply. LPG is clean and very efficient for cooking. LPG lamps provide very bright light equivalent to electricity. The down side of LPG is that the deposit on the gas cylinders is high, E75.00 per cylinder

regardless of size, and the gas cookers and lighting units and the fuel itself are expensive compared to paraffin. The cylinders are also heavy and are not convenient to carry over long distances from the supply centre. In most cases LPG fill centres are found in urban areas, and major sales areas in rural areas. The distribution of LPG is currently very limited, but according to a recent study by ESMAP CG (1997) the use of LPG is rising rapidly, especially amongst the middle income earners in peri-urban areas. MNRE would like to see an increase in the usage of LPG to reduce the dependence on natural forest, and the fact that LPG burns cleanly without smoke.

*Coal:* Swaziland has huge coal reserves, in the order of one million tons. The coal currently mined in Swaziland at the Maloma coal mine is anthracite which is a high grade coal with low emission levels. Almost all of this coal is exported to South Africa, the United States and Europe. The reason being that boilers in local industries and coal stoves used by households are imported from South Africa where the lower grade bituminous coal is abundant. Local households therefore lose the benefit of using the locally mined high grade coal. The coal supplied free to employees in company towns is bituminous coal imported from South Africa. This coal has a lot of emissions and in winter it creates smog over and around the company towns. Coal is not readily available to most households outside company towns. In most cases households with the stoves designed for the bituminous coal end up using them to burn firewood. This leads to inefficiencies as these stoves were not designed to burn wood. It would be advantageous for Swaziland to develop stoves that are affordable and at the same time be able to use the locally available anthracite coal. This would not only reduce the burden on indigenous forests but can also reduce the polluting emissions from the coal burnt in company towns and the wood burnt in bituminous coal stoves. The total energy contribution from imported coal was 13.2 % in 1995

*Bagasse:* Bagasse contributed 33.2 % of the total energy supply in 1995 (MNRE - 1997 Energy Bulletin). The bagasse is from sugar cane waste from the sugar industry, and wood wastes from the pulp and timber industries. These are used for self-generating of electricity in these industries and process heat. In 1995 electricity produced from bagasse accounted for about 30% of the total supply. Bagasse has therefore a high contribution to the energy supply and has a major advantage of being renewable. The CO<sub>2</sub> emissions from the burning of bagasse do not contribute to total CO<sub>2</sub> emissions as the regenerated plants absorb the emitted CO<sub>2</sub>.

*Solar Energy:* Solar energy is slowly gaining popularity in Swaziland. The well known use of solar energy is converting solar radiation into electricity using photovoltaic panels. The advantages of solar photovoltaic systems is that they do not have moving parts and therefore require minimal maintenance. Also, once the system is paid for there are no electric bills. The solar systems do not pollute and are therefore environmentally friendly. The problem with these systems is their low power and high cost. They can be used for lighting, small radios, television sets and other low power equipment. Their limitation is that they cannot be used for cooking and other high power applications. A major problem with photovoltaic systems is cost. The initial cost is high. However, the Netherlands Energy Research Foundation (ECN) is currently promoting a system that costs around E4,000 in Swaziland. This system can be obtained on credit over three years which makes them affordable to middle income households. It consists of a 50 W solar panel, battery, and four lights. The four lights can be used in simultaneously with a radiocassette player, and a black and white

television.

Other applications of solar energy are water heating, water purification, cooking, and drying meat, vegetables and fruits. These application are not yet widely used in Swaziland. However, there is some activity in these areas in organisations such as the University of Swaziland (UNISWA), the Swaziland College of technology (SCOT), Vocational Training Institute at Matsapha (VOCTIM), Home Economics, and Women and Development.

*Candles:* In most rural areas candles are used for lighting purposes. The reason is that candles can be used without any investment on equipment. Each candles costs around 5 cents and packet of six costs around E3.00. Candles are readily available even in the most remote areas. Candles, however, do not last long and the savings from initial investment is costly in the long run as compared to paraffin lamps or electricity. Candles with their open flame pose the risk of fires in a house and also the risk of burning injuries especially on infants.

*Wind:* The potential of wind energy has not been fully explored in Swaziland. Up until the mid seventies there used to be windmills scattered around the country used for pumping water. Most of them have disappeared and only a few are still seen whether in operating condition or not. A company in Matsapha, Swaziland Pump and Irrigation is promoting dual electric generator/wind pump systems to pump water from bore holes up to 200 m deep and also be switched to generate electricity to charge batteries. These range in price from around E20,00 to E60,000, and are out of range for low income families. They are suitable for farms and communities in windy areas. They are also non-polluting and have a very low risk of being stolen.

*Batteries:* Dry batteries are widely used in Swaziland in items such as simple radios, low power stereos, and flash lights (torches). Lead acid batteries are also used for radios, stereos, and black and white television. Most of the dry batteries are not rechargeable and are discarded indiscriminately oncc they are used up. This can lead to contamination of the soil and water as they may contain heavy metals which act as slow poisons when ingested. Children are also susceptible to their contamination as the old batteries are throw away within a short distance of the home especially in rural and peri-urban areas.

*Micro-hydro:* The potential of micro-hydro schemes for electricity generation is being carried out by some individual organisations. The potential areas for micro-hydro power stations are mainly along the Usutu and Komati rivers (Commonwealth Secretariat, 1997). Micro-hydro can take advantage of dams that have to be constructed for agricultural purposes such as the Maguga Dam and the Lower Usutu Basin scheme. More studies need to be done on the viability of this energy resource which has an advantage of being renewable, non-polluting, and the water used in driving the turbine is returned to the rivers for other uses.

*Biogas:* According to ESMAP the situation in Swaziland is not suitable for biogas due to the investment required in building biogas digester, the need to have correct mixtures of feed stock and water, and the fact that cattle in Swaziland roam over large areas making the collection of cow dung difficult. Also, water in some areas is scarce and would therefore not be easily available to feed the digester. The Women in Development section under the Deputy Prime Minister's office have experimented with biogas and found it to work at a particular homestead. They, however, had difficulty with communities since the homesteads with cattle are sparse making the transportation of the cow dung laborious.

### 1.3 Methodology

Ideally the national consultative exercise was supposed to start with literature review followed by a workshop with stake holder in the areas involving (a) women and energy, (b) women and sustainable development, and (c) income generating projects for women. This was, however, not possible because of time constraints, since the report had to be ready by 10 June 1999 for inclusion in the regional meeting in Pretoria to be held on 21-22 June 1999. The method used was to do the literature review and simultaneously contact stake holders individually to get their inputs on the above listed areas of concern, and then write the report. Not all the stake holders could be reached to give their inputs because of their various commitments at the time this report was prepared. The national consultancy workshop to refine the findings from in this report will now be held after the regional meeting, on 1 July 1999. A final report will then be produced at that time.

## 2. WOMEN'S CONCERNS RELATING TO THE ENERGY SECTOR IN SWAZILAND

In a typical Swazi household, the women and girls are mainly responsible for household chores which includes food preparation, cooking, water heating, ironing, and cleaning. This applies to both the rural and urban households, and in all social levels. According to Lasschuit (1994/95) most energy in the household in Swaziland is used for cooking. The end user of energy in a household are mainly the women (including girls). It is therefore important that the needs of women be addressed in the provision of energy and energy utilising appliances and utensils. Most of the studies reported in the literature address the issue of energy in the household as an entity. The studies do not address the issue of who is the actual end user of the energy and energy using appliances in the household. The identification of the end users and the needs of the end users of the energy and energy products are not addressed. With the publication of the UNDP Energy and Women, Project Document the issue of women and energy is now being addressed as a vital component in overall development.

In Swaziland households of all social levels are found throughout the country. There are poor people in rural areas as well as in urban areas according to today's urban boundaries. Likewise middle income and high income households are found in the cities and towns as well as in the remote rural areas. The discussion below does not differentiate between the rural low income and urban low income groups etc. It also does not differentiate between the geographic locations in the country. What may be a problem in a rural household in the northern treeless high lands may not be a problem to a low income household in some other place. Below the problems faced by women in each social group are grouped together. They can be separated when a project has been identified for a specific income group at a specific location.

### 2.1 Low Income Groups

The problems faced by women in low income groups in rural areas (depending on geographical location), company towns, and urban areas were found to be as follows: